

Conservation Biology



Influence of Landscape Pattern on Habitat Use by American Marten in an Industrial Forest

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Abstract

Few studies have examined the potential for clearcutting to fragment habitat of area-sensitive, forest-dependent mammals such as American marten (*Martes americana*). We examined relationships among measures of landscape pattern and spatial use of habitat by 33 resident and 32 nonresident, adult marten that were radio-monitored in an extensively logged landscape. Size and distribution of forest patches (trees over 6 m in height) were associated with patch use by marten. Patches of forest used by resident marten (median = 27 ha, $n = 12$) were larger ($p < 0.003$) than patches with no observed use (median = 1.5 ha, $n = 128$). Further, patches used by residents were closer to the nearest patch larger than 2.7 ha (38 m versus 55 m; $p = 0.057$) and to an adjacent forest preserve (2.5 km versus 3.5 km; $p = 0.075$) than patches with no observed use. At four spatial scales (10, 65, 125, and 250 ha), grid cells used by resident marten comprised a greater percentage of residual forest over 6 m in height ($p \leq 0.008$) and intersected forest patches of greater area ($p \leq 0.006$) than cells with no observed use. Edge indices were not different ($p \geq 0.490$) between used grid cells and cells with no observed use at any of the four spatial scales. Analyses of forest edge associations indicated that marten did not avoid residual-regenerating forest edge within home ranges or within the study area. Home ranges ($n = 27$) of all resident, adult marten were composed of more than 60% forest cover over 6 m in height; median values were 78–80% for both sexes. The median size of the largest forest patch in marten home ranges was 150 ha for females and 247 ha for males. Our results suggest that reducing fragmentation by consolidating clearcuts and retaining large residual patches would help to maintain resident marten in extensively logged landscapes.

Influencia del Patrón del Paisaje en el Uso del Hábitat por la Marta Americana en un Bosque Industrial

Pocos estudios han examinado el efecto de la tala en hábitats fragmentados de mamíferos sensibles al área y dependientes del bosque como lo es la marta americana (*Martes americana*). Examinamos las relaciones entre mediciones de patrones del paisaje y uso espacial de hábitat por 33 martas adultas residentes y 32 no residentes monitoreadas por radiotelemetría en un pasaje extensivamente talado. El tamaño y la distribución de parches de bosque (árboles > 6 m de altura) fueron asociados con parches usados por las martas.

Los parches de bosque usados por martas residentes (mediana = 27 ha, $n = 12$) fueron mayores ($p < 0.003$) que los parches en los que no se observó uso (mediana = 1.5 ha, $n = 128$). Asimismo, los parches usados por residentes estuvieron más cerca a parches mayores de 2.7 ha (38 vs. 55 m; $p = 0.057$) y a bosques adyacentes conservados (2.5 km vs. 3.5 km; $p = 0.075$) que los parches en los que no se observó uso. A cuatro escalas espaciales (10, 65, 125 y 250 ha) las celdas usadas por las martas residentes comprendieron un porcentaje mayor de bosque residual > 6 m de altura ($p \leq 0.008$) y de parches que interceptaron bosque de área mayor ($p \leq 0.006$) que las celdas en las que no se observó. Los índices de borde no fueron significativamente diferentes ($p \geq 0.49$) entre celdas usadas y las celdas que no mostraron uso a ninguna de las cuatro escalas espaciales usadas. Los análisis de asociaciones en el borde del bosque indicaron que las martas no evitaron bordes de bosque residual en regeneración dentro de los rangos de hogar o dentro del área de estudio. Los rangos de hogar ($n = 27$) de todas las martas residentes estuvieron compuestos por un 60% de cobertura forestal > 6 m de altura; los valores de la mediana para ambos sexos estuvieron entre 78 y 80%. El valor de la mediana para los parches de bosque más grandes usados por las martas fue de 150 ha para hembras y 247 ha para machos. Nuestros resultados sugieren que la reducción de la fragmentación al consolidar la tala intensiva y retener parches residuales grandes podría ayudar a mantener poblaciones de martas residentes en paisajes talados extensivamente.

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